Background

1. At the 25th Session of the Codex Committee on Fats and Oils (CCFO25) held in Kuala Lumpur, Malaysia, in 2017, one delegation noted that the Standard for Olive Oils and Olive Pomace Oils (CXS 33-1981) had not been reviewed in the past 15 years, despite the fact that there had been considerable technological and scientific innovations, cultivation areas had expanded, and the volumes and value of trade had increased.

2. The Committee agreed to start new work on the revision of Sections 3, 8 and the Appendix of the Standard for Olive Oils and Olive Pomace Oils (CXS 33-1981). In considering this work, the Committee clarified that the proposed work would take into account the needs of Codex members, the latest technological knowledge, and scientific progress of the sector in order to facilitate trade, promote consumer protection and facilitate the harmonization of national legislation with Codex.

3. The Committee also agreed to establish an electronic working group (EWG), chaired by Spain, co-chaired by Argentina and Canada, and working in English only, to prepare the proposed draft revisions of the Standard for Olive Oils and Olive Pomace Oils (CXS 33-1981), for consideration at the next CCFO session.

4. At the 26th Session of CCFO in 2019, the report of the EWG on the proposed draft revision to Sections 3, 8 and the Appendix of the Standard for Olive Oils and Olive Pomace Oils (CXS 33-1981) was discussed at length and in detail at a physical working group (PWG) meeting held immediately prior to CCFO26, and the report of the PWG presented and discussed during the plenary sessions. After so much deliberation, there were still many areas of the proposed draft that needed further discussion and clarification. The Committee agreed to return the proposed draft sections 3, 8, and Appendix to Step 2 for redrafting, and re-established the EWG to continue working on these revisions, noting the following terms of reference:

- to focus on items in square brackets and issues where delegations expressed strong concerns, with a view to reach agreement;
- to collect available data and information on DAGs, PPPs, and FAEE, and to study ways how these can be taken into account in the standard;
- to review and discuss data on linolenic acid if available, and to propose a possible limit for this in the standard;
- to discuss other issues raised by members, e.g. lampante oil, campesterol content, waxes content for blends of refined and virgin olive oils; and to review the format of the tables; and
- to prepare a report of the EWG for consideration by CCFO27.

* Algeria, Argentina, Australia, Brazil, Canada, Croatia, Ecuador, Egypt, EU, France, Germany, Greece, Korea, India, Iran, Italy, Malaysia, Mexico, Morocco, New Zealand, Peru, Poland, Spain, Slovenia, Syria, Thailand, Tunisia, Turkey, UK, Uruguay, USA, IOOC
Timeline and Discussions

5. The Electronic Working Group was re-established in July 2019 with an invitation from Spain, Argentina, and Canada to Codex members and observer organizations interested in participating in this electronic working group. Representatives from 31 Codex member countries including the European Union and one observer organization, expressed interest to participate (Annex II).

6. Two welcome letters were sent to the EWG members with suggestions on a path forward to address the ongoing issues. It was highlighted that the Codex guiding principles must be the references that must always be considered, and that negative responses to an argued proposal must be adequately supported by sound arguments in order to avoid stalling the discussions.

7. The EWG worked from September 2019 to March 2021 and discussed areas that the members could not agree on at the last session, and provisions that were placed in square brackets in the report of CCFO26. The group held its discussions over 11 rounds of working documents (WD), each round included a document that analyzed and presented arguments and evidence related to contentious sections in square brackets in the proposed draft revision to the standard. This included:

- Removal of ordinary virgin olive oil from the standard.
- Expression of the defect’s median of the limit between fit and unfit for consumption categories.
- Removal of footnote of the definitions of refined olive oil and refined olive-pomace oil.
- Definition of oil consisting of a blend of refined olive oil and virgin olive oils.
- The naming of the blend of refined olive-pomace oil and edible virgin olive oils.
- Note on lampante olive oil.
- Decision scheme of delta-7-stigmastenol and, in general, of the applicability of decision schemes.
- Confirmation of the genuineness of olive and olive-pomace oils considering fatty acids and sterols.
- Harmonization of the waxes’ limit content.
- Note on the application of cis-fatty acid values to crude oils not considered in CXS 33.
- Definition of organoleptic characteristics in refined olive and olive-pomace oil.
- Consideration of a limit to linolenic acid.
- Consideration of the edible virgin oils’ total sterols content not as a purity parameter.
- Consideration of ΔK as a purity parameter of edible virgin oils.
- Applicability of PPP and 1,2 DGAs in CXS 33.
- Updating Methods of analysis.
- Review of the Standard’s format and tables, including changing of the order and location of certain parameters to improve the logic and flow of the document.

8. Consensus was reached on a few of the 22 proposals put forward through the working documents, and progress was made in bringing the majority of the members to support specific changes which could be considered for revision. However, there continued to be a number of areas where divergent opinions were received (consideration or not of the geographical, climatic and genetic variations on the fatty acids and sterols composition, consideration or not of the total sterols content as an essential composition factor, prohibition or not of the refined oils’ marketing, fatty acids’ limits expression with one or two decimal places, organoleptic median’s limit between fit and unfit for consumption of virgin oils, consideration or not of PPP and DAGs as extra virgin olive oil quality criteria) and which will be brought to the 27th session of CCFO for consideration.

Conclusion and Recommendations

9. Annex I (clean version of the EWG Report) and Annex II (EWG Report in Track Change) contain the proposed draft revisions to the standard, including the amendments to section 3, 8 and the Appendix to CXS 33-1981 agreed by the EWG members. The items that the EWG did not reach consensus are indicated in square brackets for further consideration by CCFO27.

10. The EWG also recommends the consequential amendment to section 4 Food Additives to take into account the new definition of the blend of refined olive oil and virgin and extra virgin olive oil, named olive oil composed of refined olive oil and virgin olive oils, and the blend of refined olive-pomace oil and virgin and extra virgin olive oils, named olive-pomace oil composed of refined olive pomace oil and virgin olive oils.
1. SCOPE
This standard applies to olive oils and olive-pomace oils described in Section 2 presented in a state for human consumption.

2. DESCRIPTION
Olive oil is the oil obtained solely from the fruit of the olive tree (Olea europaea L.), to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds.

Virgin olive oils are the oils obtained from the fruit of the olive tree solely by mechanical or other physical means under conditions, particularly thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decanting, centrifuging, and filtration.

Olive-pomace oil is the oil obtained by treating olive pomace with solvents other than halogenated solvents or by other physical treatments, to the exclusion of oils obtained by re-esterification processes and of any mixture with oils of other kinds.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS
3.1 Designations and definitions
Extra virgin olive oil: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 0.8 grams per 100 grams and whose other physicochemical and organoleptic characteristics correspond to those laid down for this category.

Virgin olive oil: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 2.0 grams per 100 grams and whose other physicochemical and organoleptic characteristics correspond to those laid down for this category.

Refined olive oil: olive oil obtained from virgin olive oils by refining methods (including methods aiming to the complete or partial removal of chemical compounds responsible for organoleptic descriptors) that do not lead to alterations in the initial glyceridic structure. It has a free acidity, expressed as oleic acid, of not more than 0.3 grams per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.\(^1\)

Olive oil composed of refined olive oil and virgin olive oils: olive oil consisting of a blend of refined olive oil and extra virgin olive oil and/or virgin olive oil. It has a free acidity, expressed as oleic acid, of not more than 1 gram per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.

Refined olive-pomace oil: Olive-pomace oil obtained from crude olive-pomace oil by refining methods that do not lead to alterations in the initial glyceridic structure. It has a free acidity, expressed as oleic acid, of not more than 0.3 grams per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.\(^1\)

Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils: olive-pomace oil consisting of a blend of refined olive-pomace oil and extra virgin olive oil and/or virgin olive oil. It has a free acidity, expressed as oleic acid, of not more than 1 gram per 100 grams and its other physicochemical characteristics correspond to those laid down for this category. In no case shall this blend be called «olive oil».

Note: Genuine virgin olive oil that does not meet one or more of the virgin olive oil's quality criteria of this standard is referred to as LAMPANTE OLIVE OIL. It is considered unfit for human consumption either as it stands or blended with other oils.

3.2 COMPOSITION FACTORS
3.2.1 GLC ranges of fatty acid composition (expressed as percentages of total fatty acids)

[Samples falling within the appropriate fatty acid ranges specified below are in compliance with this Standard. Supplementary criteria, for example national geographical and/or climatic variations, may be considered, as necessary, to confirm that a sample is in compliance with the Standard.]

The fatty acid values in this table apply to the oils described in Section 3.1 presented in a state for human consumption. However, to provide clarity in the trade of lampante olive oil and crude olive-pomace oil, the values of the table, trans isomers excluded, may also be applied.

\(^1\) This product may only be sold direct to the consumer if permitted in the country of retail sale
<table>
<thead>
<tr>
<th>Fatty acid</th>
<th>Extra virgin olive oil</th>
<th>Olive oil composed of refined olive oil and virgin olive oils</th>
<th>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Virgin olive oil</td>
<td>Refined olive oil</td>
<td>Refined olive-pomace oil</td>
</tr>
<tr>
<td>C14:0</td>
<td>≤ 0.03</td>
<td>≤ 0.03</td>
<td>≤ 0.03</td>
</tr>
<tr>
<td>C16:0</td>
<td>7.0 – 20.0</td>
<td>7.0 – 20.0</td>
<td>7.0 – 20.0</td>
</tr>
<tr>
<td>C16:1</td>
<td>0.3 – 3.5</td>
<td>0.3 – 3.5</td>
<td>0.3 – 3.5</td>
</tr>
<tr>
<td>C17:0</td>
<td>≤ 0.4</td>
<td>≤ 0.4</td>
<td>≤ 0.4</td>
</tr>
<tr>
<td>C17:1</td>
<td>≤ 0.6</td>
<td>≤ 0.6</td>
<td>≤ 0.6</td>
</tr>
<tr>
<td>C18:0</td>
<td>0.5 – 5.0</td>
<td>0.5 – 5.0</td>
<td>0.5 – 5.0</td>
</tr>
<tr>
<td>C18:1</td>
<td>[53.0] [55.0] – 85.0</td>
<td>[53.0] [55.0] – 85.0</td>
<td>[53.0] [55.0] – 85.0</td>
</tr>
<tr>
<td>C18:2</td>
<td>2.5 – 21.0</td>
<td>2.5 – 21.0</td>
<td>2.5 – 21.0</td>
</tr>
<tr>
<td>C18:3</td>
<td>≤ 0.6</td>
<td>≤ 0.6</td>
<td>≤ 0.6</td>
</tr>
<tr>
<td>C20:0</td>
<td>≤ 0.6</td>
<td>≤ 0.6</td>
<td>≤ 0.6</td>
</tr>
<tr>
<td>C20:1</td>
<td>≤ 0.5</td>
<td>≤ 0.5</td>
<td>≤ 0.5</td>
</tr>
<tr>
<td>C22:0</td>
<td>≤ 0.2</td>
<td>≤ 0.2</td>
<td>≤ 0.3</td>
</tr>
<tr>
<td>C24:0</td>
<td>≤ 0.2</td>
<td>≤ 0.2</td>
<td>≤ 0.2</td>
</tr>
</tbody>
</table>

Trans fatty acids

\[
\Sigma(t-C18:1) \leq [0.1] \\
\Sigma(t-C18:2) + \Sigma(t-C18:3) \leq [0.1] \\
\Sigma(t-C18:2 + \Sigma(t-C18:3) \leq [0.3] \\
\Sigma(t-C18:3) \leq [0.4]
\]

3.2.2 ΔECN42 (Difference between the actual and theoretical ECN 42 triglyceride content)

Extra virgin olive oil
Virgin olive oil
Refined olive oil
Olive oil composed of refined olive oil and virgin olive oils
Refined olive-pomace oil
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

3.2.3 4α-Desmethylsterols composition (% total 4α-desmethylsterols)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol</td>
<td>≤ 0.5</td>
</tr>
<tr>
<td>Brassicasterol</td>
<td>≤ 0.1 for olive oils ≤ 0.2 for olive-pomace oils</td>
</tr>
<tr>
<td>Campesterol</td>
<td>≤ 4.0[^a]</td>
</tr>
<tr>
<td>Stigmasterol</td>
<td>&lt; campesterol</td>
</tr>
<tr>
<td>Δ7-stigmastenol</td>
<td>≤ 0.5[^b]</td>
</tr>
<tr>
<td>Apparent β-sitosterol[^c]</td>
<td>≥ 93.0</td>
</tr>
</tbody>
</table>

[^a] When an authentic oil naturally has a campesterol level >4.0% and ≤ 4.5%, it is considered virgin or extra virgin olive oil if the stigmasterol level is ≤ 1.4% and the delta-7-stigmastenol level is ≤ 0.3%. The other parameters shall meet the limits set out in the standard.

[^b] For virgin olive oils If the value is >0.5 y ≤0.8%, campesterol must be ≤3.3, apparent β-sitosterol/(campesterol+Δ7-stigmastenol) ≥25, stigmasterol ≤1.4 and ΔECN42 ≤0.1. For refined olive pomace oil values >0.5 and ≤0.7 then stigmasterol ≤1.4% and ΔECN42 ≤ 0.4.

[^c] Chromatographic peak composed by Δ5,23-stigmastadienol+clerosterol+β-sitosterol+sitostanol+Δ5-avenasterol+Δ5,24-stigmastadienol peaks.

[^Pending the results of IOC (International Olive Council) survey and further considerations by the Committee on Fats and Oils. National limits may remain in place.]
Virgin olive oil's authenticity is not compromised if one sterol, or their minimum content, does not fall within the ranges provided for if all other sterols and parameters tested referred to in this standard fall within the stated ranges.

### 3.2.4 Total 4α-desmethylsterols content (mg/kg)

- **Refined olive oil**: \( \geq 1,000 \)
- **Olive oil composed of refined olive oil and virgin olive oils**: \( \geq 1,800 \)
- **Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils**: \( \geq 1,600 \)

### 3.2.5 Erythrodiol and uvaol (% total 4α-desmethylsterols + erythrodiol and uvaol)

- **Extra virgin olive oil**: \( \geq 1,000 \)
- **Virgin olive oil**: \( \leq 4.5 \)
- **Refined olive oil**: \( \geq 1,800 \)
- **Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils**: \( \geq 1,600 \)
- **Refined olive-pomace oil**: \( > 4.5 \)

### 3.2.6 Waxes content (mg/kg)

- **Extra virgin olive oil**: \( \leq 150 \)
- **Virgin olive oil**: \( \leq 350 \)
- **Refined olive oil**: \( \leq 350 \)
- **Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils**: \( > 350 \)

#### Notes:
- \( d \): Sum of \( C_{40} \) esters + \( C_{42} \) esters + \( C_{44} \) ester
- \( e \): Sum of \( C_{40} \) esters + \( C_{42} \) esters + \( C_{44} \) esters + \( C_{46} \) ester

### 3.2.7 Stigmastadienes content (mg/kg)

- **Extra virgin olive oil**: \( \leq 0.05 \)
- **Virgin olive oil**: \( \leq 0.05 \)
- **Olive oil composed of refined olive oil and virgin olive oils**: \( \leq 0.05 \)
- **Refined olive oil**: \( \leq 0.05 \)
- **Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils**: \( \leq 0.05 \)

### 3.2.8 Percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol)

- **Extra virgin olive oil**: \( \text{If } C16:0 \leq 14.0 \%, 2P \leq 0.9 \% \)
- **Virgin olive oil**: \( \text{If } C16:0 > 14.0 \%, 2P \leq 1.0 \% \)
- **Olive oil composed of refined olive oil and virgin olive oils**: \( \text{If } C16:0 \leq 14.0 \%, 2P \leq 0.9 \% \)
- **Refined olive oil**: \( \text{If } C16:0 > 14.0 \%, 2P \leq 1.1 \% \)
- **Refined olive-pomace oil**: \( 2P \leq 1.4 \% \)
- **Olive-pomace oil composed of refined olive pomace oil and virgin olive oils**: \( 2P \leq 1.2 \% \)

### 3.2.9 \( [\Delta K_{270}] \)

- **Extra virgin olive oil**: \( \leq 0.01 \)
- **Virgin olive oil**: \( \leq 0.01 \)

#### Notes:
- \( f \): Defined as \( \Delta K_{270} = K_{270} - \frac{1}{2} (K_{266} + K_{274}) \)
- \( g \): \( 270 \) nm when using cyclohexane; \( 268 \) nm when using iso-octane.
### 3.3 QUALITY FACTORS

#### 3.3.1 Organoleptic characteristics of virgin olive oils

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Median of the most perceived defect</th>
<th>Median of the fruity attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>0.0</td>
<td>&gt; 0.0</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>[2.5] [3] [3.5]</td>
<td>&gt; 0.0</td>
</tr>
</tbody>
</table>

#### 3.3.2 Free fatty acids (g/100 g, expressed as oleic acid)

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 0.8</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>≤ 2.0</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>≤ 0.3</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 1.0</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>≤ 0.3</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>≤ 1.0</td>
</tr>
</tbody>
</table>

#### 3.3.3 Peroxide value (milliequivalents of active oxygen/kg oil)

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 20</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>≤ 20</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>≤ 5</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 15</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>≤ 5</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>≤ 15</td>
</tr>
</tbody>
</table>

#### 3.3.4 Absorbance in the ultraviolet region at 270/or 268 nm\(\text{f}\) (expressed as \(K_{270}\)/or \(K_{268}\))

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 0.22</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>≤ 0.25</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>≤ 1.25</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 1.15</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>≤ 2.00</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>≤ 1.70</td>
</tr>
</tbody>
</table>

\(\text{f})\): 270 nm when using cyclohexane; 268 nm when using iso-octane.

#### 3.3.5 \(\Delta K\)\(\text{f,g}\)

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined olive oil</td>
<td>≤ 0.16</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 0.15</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>≤ 0.20</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>≤ 0.18</td>
</tr>
</tbody>
</table>

\(\text{f})\) Defined as \(\Delta K_{270} = K_{270} - \frac{1}{2}(K_{266} + K_{274})\)

\(\text{g})\): 270 nm when using cyclohexane; 268 nm when using iso-octane.

#### [3.3.6 Fatty acid ethyl esters (mg/kg)]

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Extra virgin olive oil]</td>
<td>≤ 35</td>
</tr>
</tbody>
</table>
4. FOOD ADDITIVES

4.1 Virgin olive oils
No additives are permitted in these products.

4.2 Refined olive oil, olive oil composed of refined olive oil and virgin olive oils, refined olive-pomace oil, and olive-pomace oil composed of refined olive-pomace oil and virgin olive oils.

The addition of alpha-tocopherols (d-alpha tocopherol (INS 307a); mixed tocopherol concentrate (INS 307b); dl-alpha-tocopherol (INS 307c)) to the above products is permitted to restore natural tocopherol lost in the refining process. The concentration of alpha-tocopherol in the final product shall not exceed 200 mg/kg.

5. CONTAMINANTS

5.1 The products covered by this Standard shall comply with the Maximum Levels of the General Standard for Contaminants and Toxins in Food and Feed (CXS 193-1995).

5.2 Pesticide residues
The products covered by the provisions of this standard shall comply with those maximum residue limits established by the Codex Alimentarius Commission for these commodities.

5.3 Halogenated solvents
Maximum content of each halogenated solvent: 0.1 mg/kg
Maximum content of the sum of all halogenated solvents: 0.2 mg/kg

6. HYGIENE

It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the General Principles of Food Hygiene (CXC 1-1969), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

The products should comply with any microbiological criteria established in accordance with the Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods (CXG 21-1997).

7. LABELLING

The products shall be labelled in accordance with the General Standard for the Labelling of Prepackaged Foods (CXS 1–1985).

7.1 Name of the food
The name of the product shall be consistent with the descriptions as shown in Section 3 of this standard. In no case shall the designation ‘olive oil’ be used to refer to olive-pomace oils.

7.2 Labelling of Non-Retail Containers
Information on the above labelling requirements shall be given either on the container or in accompanying documents, except that the name of the food, lot identification and the name and address of the manufacturer or packer shall appear on the container.

However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF ANALYSIS AND SAMPLING

The most updated version of the methods should be used, in application of ISO/IEC 17025.

<table>
<thead>
<tr>
<th>Provision</th>
<th>Method</th>
<th>Principle</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Organoleptic characteristics of virgin olive oils</td>
<td>COI/T.20/Doc. n° 15</td>
<td>Panel test</td>
<td>I</td>
</tr>
<tr>
<td>8.2 Free fatty acids</td>
<td>ISO 660</td>
<td>Titrimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>COI/T.20/Doc. n° 34</td>
<td>Titrimetry</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>AOCS Ca 5a-40</td>
<td>Titrimetry</td>
<td>II</td>
</tr>
<tr>
<td>8.3 Peroxide value</td>
<td>ISO 3960</td>
<td>Titrimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Cd 8b-90</td>
<td>Titrimetry</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>COI/T.20/Doc. n° 35</td>
<td>Titrimetry</td>
<td>II</td>
</tr>
</tbody>
</table>
| 8.4 | Absorbance in the ultraviolet region | COI/T.20/Doc. nº 19 | Absorption in ultraviolet | II  
| ISO 3656 | Absorption in ultraviolet | II  
| AOCS Ch 5-91. | Absorption in ultraviolet | II  
| 8.5 | Fatty acid composition | COI/T.20/Doc. nº33 | Gas chromatography | II  
| AOCS Ch2-91 | Gas chromatography | II  
| ISO 12966-2 and ISO 12966-4. | Gas chromatography | II  
| 8.6 | 4α-desmethylsterol composition and its total content and erythrodiol and uvaol | COI/T.20/Doc. nº26 | Gas chromatography | II  
| ISO 12228-2 | Gas chromatography | II  
| AOCS Ch 6-91. | Gas chromatography | II  
| 8.7 | Waxes and ethyl esters content | COI/T.20/Doc. nº 28 | Gas chromatography | II  
| AOCS Ch 8-02 | Gas Chromatography | II  
| 8.8 | Stigmastadienes content | COI/T.20/Doc. nº 11 | Gas Chromatography | II  
| ISO 15788-1 | Gas Chromatography | II  
| AOCS Cd 26-96 | Gas Chromatography | II  
| 8.9 | Difference between the actual and theoretical ECN 42 triglyceride | COI/T.20/Doc. nº 20 | HPLC and calculation | II  
| AOCS Ce 5b-89. | HPLC and calculation | I  
| 8.10 | Percentage of 2-glyceryl monopalmitate | COI/T.20/Doc. nº 23 | Gas Chromatography | II  
| ISO 12872 | Gas Chromatography | II  
| 8.11 | Determination of ΔK | COI/T.20/Doc. nº 19 | Absorption in ultraviolet | II  
| ISO 3656 | Absorption in ultraviolet | II  
| AOCS Ch 5-91 | Absorption in ultraviolet | II  
| 8.12 | Alpha-tocopherol content | ISO 9936 | HPLC | II  
| AOCS Ce 8-89 | HPLC | II  
| 8.13 | Detection of traces of halogenated solvents | ISO 16035 | Static headspace gas chromatography | II  

<table>
<thead>
<tr>
<th>Commodity Category</th>
<th>Method of sampling</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olive oils and Olive-Pomace Oils</td>
<td>ISO 661 and ISO 5555</td>
<td></td>
</tr>
</tbody>
</table>
OTHER QUALITY AND COMPOSITION FACTORS

These quality and composition factors are supplementary information to the essential composition and quality factors of the standard. A product which meets the essential quality and composition factors but does not meet these supplementary factors, may still conform to the standard.

1. QUALITY CHARACTERISTICS

1.1 Organoleptic characteristics

Extra virgin and virgin olive oils: See Section 3.3.1

<table>
<thead>
<tr>
<th>Type of oil</th>
<th>Odour</th>
<th>Taste</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined olive oil</td>
<td>Acceptable</td>
<td></td>
<td>light yellow</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>Good</td>
<td></td>
<td>light yellow to green</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>Acceptable</td>
<td></td>
<td>light yellow to brownish-yellow</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>Good</td>
<td></td>
<td>light yellow to green</td>
</tr>
</tbody>
</table>

1.2 Moisture and volatile matter (g/100 g)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 0.2</td>
<td></td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>≤ 0.1</td>
<td></td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>≤ 0.1</td>
<td></td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 0.1</td>
<td></td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>≤ 0.1</td>
<td></td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>≤ 0.1</td>
<td></td>
</tr>
</tbody>
</table>

1.3 Insoluble impurities in light petroleum (g/100 g)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 0.1</td>
<td></td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refined olive oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 0.1</td>
<td></td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>≤ 0.05</td>
<td></td>
</tr>
</tbody>
</table>

1.4 Absorbance in the ultraviolet region at 232 nm (expressed as $K_{232}$)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 2.50</td>
<td></td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>≤ 2.60</td>
<td></td>
</tr>
</tbody>
</table>

[1.5 1,2-diglycerides (% total diglycerides)]

[Extra virgin olive oil] [≥ 35]

[1.6 Pyropheophytin "a" (% total chlorophyll pigments)]

[Extra virgin olive oil] [≤ 17]
1.7 Trace metals (mg/kg)
All olive oils and olive-pomace oils
Iron (Fe) \( \leq 3.0 \)
Copper (Cu) \( \leq 0.1 \)

2. CHEMICAL AND PHYSICAL CHARACTERISTICS

2.1 Relative density \( (d_r^{20}) (20 \degree C/water at 20 \degree C) \)
Extra virgin olive oil
Virgin olive oil
Refined olive oil
Olive oil composed of refined olive oil and virgin olive oils
Refined olive-pomace oil
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

2.2 Refractive index \( (n_D^{20}) \)
Extra virgin olive oil
Virgin olive oil
Refined olive oil
Olive oil composed of refined olive oil and virgin olive oils
Refined olive-pomace oil
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

2.3 Saponification value (mg KOH/g)
Extra virgin olive oil
Virgin olive oil
Refined olive oil
Olive oil composed of refined olive oil and virgin olive oils
Refined olive-pomace oil
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

2.4 Iodine value (Wijs method)
Extra virgin olive oil
Virgin olive oil
Refined olive oil
Olive oil composed of refined olive oil and virgin olive oils
Refined olive-pomace oil
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

2.5 Unsaponifiable matter (g/kg)
Extra virgin olive oil
Virgin olive oil
Refined olive oil
Olive oil composed of refined olive oil and virgin olive oils
Refined olive-pomace oil
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils
### 3. METHODS OF ANALYSIS AND SAMPLING

<table>
<thead>
<tr>
<th>Provision</th>
<th>Method</th>
<th>Principle</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Moisture and volatile matter</td>
<td>ISO 662</td>
<td>Gravimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Ca 2c-25</td>
<td>Gravimetry</td>
<td></td>
</tr>
<tr>
<td>3.2 Insoluble impurities in light petroleum</td>
<td>ISO 663</td>
<td>Gravimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Ca 3a-46</td>
<td>Gravimetry</td>
<td></td>
</tr>
<tr>
<td>3.3 Trace metals (iron, copper)</td>
<td>ISO 8294</td>
<td>AAS</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>ISO 21033</td>
<td>ICP-OES</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Ca 18b-91</td>
<td>AAS</td>
<td>II</td>
</tr>
<tr>
<td>3.4 Relative density</td>
<td>ISO 8883</td>
<td>Pycnometry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Cc 10c-95</td>
<td>Pycnometry</td>
<td></td>
</tr>
<tr>
<td>3.5 Refractive index</td>
<td>ISO 6320</td>
<td>Refractometry</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>AOCS Cc 7-25</td>
<td>Refractometry</td>
<td>II</td>
</tr>
<tr>
<td>3.6 Saponification value</td>
<td>ISO 3557</td>
<td>Titrimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Cd 3-25</td>
<td>Titrimetry</td>
<td>I</td>
</tr>
<tr>
<td>3.7 Iodine value</td>
<td>ISO 3961</td>
<td>Wijs-Titrimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Cd 1d-92</td>
<td>Wijs-Titrimetry</td>
<td>I</td>
</tr>
<tr>
<td>3.8 Unsaponifiable matter</td>
<td>ISO 3596</td>
<td>Gravimetry</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>AOCS Ca 6b-53</td>
<td>Gravimetry</td>
<td>I</td>
</tr>
<tr>
<td>3.9 Absorbance in the ultraviolet region – K_{232}</td>
<td>COI/T.20/Doc. nº 19</td>
<td>Absorption in ultraviolet</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>ISO 3656</td>
<td>Absorption in ultraviolet</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>AOCS Ch 5-91</td>
<td>Absorption in ultraviolet</td>
<td>II</td>
</tr>
<tr>
<td>3.10 [Pyropheophytin “a”]</td>
<td>[ISO 29841]</td>
<td>HPLC</td>
<td>I</td>
</tr>
<tr>
<td>3.11 [1,2-diglycerides]</td>
<td>[ISO 29822]</td>
<td>Gas chromatography</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>ISO 12228-2</td>
<td>Gas chromatography</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>AOCS Ch 6-91</td>
<td>Gas chromatography</td>
<td>II</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commodity Category</th>
<th>Method of sampling</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Olive oils and Olive-Pomace Oils</td>
<td>ISO 661 and ISO 5555</td>
<td></td>
</tr>
</tbody>
</table>
E

PROPOSED DRAFT REVISION TO THE STANDARD FOR OLIVE OILS AND OLIVE POMACE OILS
(CXS 33-1981)
(Step 3)

The output from the EWG (track change version) (see Annex 1 for the clean version)

Notes on Proposed Revisions to Current Standard:
- **Bold and underlined with red font**: amendment agreed to by all/majority of members of the electronic working group (consensus)
- [In square brackets and underlined with red font]: proposed amendment but not agreed to by all/majority of members (no consensus)
- **Single Strikethrough**: text agreed to be deleted (with consensus);
- **Double Strikethrough**: text identified for deletion at CCFO26
- [Strikethrough in square brackets]: text proposed to be deleted but not agreed to by all/majority of EWG members.
- Topics highlighted in blue were agreed upon by CCFO26 in the 2019’s plenary.

1. SCOPE
This standard applies to olive oils and olive-pomace oils described in Section 2 presented in a state for human consumption.

2. DESCRIPTION
**Olive oil** is the oil obtained solely from the fruit of the olive tree (*Olea europaea* L.), to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds.

**Virgin olive oils** are the oils obtained from the fruit of the olive tree solely by mechanical or other physical means under conditions, particularly thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decanting, centrifuging, and filtration.

**Olive-pomace oil** is the oil obtained by treating olive pomace with solvents other than halogenated solvents or by other physical treatments, to the exclusion of oils obtained by re-esterification processes and of any mixture with oils of other kinds.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS
3.1 Designations and definitions
**Extra virgin olive oil**: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 0.8 grams per 100 grams and whose other physicochemical and organoleptic characteristics correspond to those laid down for this category.

**Virgin olive oil**: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 2.0 grams per 100 grams and whose other physicochemical and organoleptic characteristics correspond to those laid down for this category.

**Ordinary virgin olive oil**: virgin olive oil with a free acidity, expressed as oleic acid, of not more than 3.3 grams per 100 grams and whose other characteristics correspond to those laid down for this category.

**Refined olive oil**: olive oil obtained from virgin olive oils by refining methods [including methods aiming to the complete or partial removal of chemical compounds responsible for organoleptic descriptors] that do not lead to alterations in the initial glyceridic structure. It has a free acidity, expressed as oleic acid, of not more than 0.3 grams per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.

---

1. This product may only be sold direct to the consumer if permitted in the country of retail sale.
Olive oil composed of refined olive oil and virgin olive oils: olive oil consisting of a blend of refined olive oil and extra virgin olive oil and/or virgin olive oils suitable for human consumption. It has a free acidity, expressed as oleic acid, of not more than 1 gram per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.

Refined olive-pomace oil: Olive-pomace oil obtained from crude olive-pomace oil by refining methods which do not lead to alterations in the initial glyceridic structure. It has a free acidity, expressed as oleic acid, of not more than 0.3 grams per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.

Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils: olive-pomace oil consisting of a blend of refined olive-pomace oil and extra virgin olive oil and/or virgin olive oil. It has a free acidity, expressed as oleic acid, of not more than 1 gram per 100 grams and its other physicochemical characteristics correspond to those laid down for this category.

In no case shall this blend be called «olive oil».

Note: Genuine virgin olive oil that does not meet one or more of the virgin olive oil’s quality criteria of this standard is referred to as LAMPANTE OLIVE OIL. It is considered unfit for human consumption either as it stands or blended with other oils.

3.2 COMPOSITION FACTORS

3.2.1 GLC ranges of fatty acid composition (expressed as percentages of total fatty acids)

<table>
<thead>
<tr>
<th>Fatty acid</th>
<th>Extra virgin olive oil</th>
<th>Olive oil composed of refined olive oil and virgin olive oils</th>
<th>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</th>
</tr>
</thead>
<tbody>
<tr>
<td>C14:0</td>
<td>0.0 – 0.05 ≤ 0.03</td>
<td>0.0 – 0.05 ≤ 0.03</td>
<td>0.0 – 0.05 ≤ 0.03</td>
</tr>
<tr>
<td>C16:0</td>
<td>7.0 – 20.0</td>
<td>7.0 – 20.0</td>
<td>7.0 – 20.0</td>
</tr>
<tr>
<td>C16:1</td>
<td>0.3 – 3.5</td>
<td>0.3 – 3.5</td>
<td>0.3 – 3.5</td>
</tr>
<tr>
<td>C17:0</td>
<td>0.0 – 0.3 ≤ 0.4</td>
<td>0.0 – 0.3 ≤ 0.4</td>
<td>0.0 – 0.3 ≤ 0.4</td>
</tr>
<tr>
<td>C17:1</td>
<td>0.0 – 0.3 ≤ 0.6</td>
<td>0.0 – 0.3 ≤ 0.6</td>
<td>0.0 – 0.3 ≤ 0.6</td>
</tr>
<tr>
<td>C18:0</td>
<td>0.5 – 5.0</td>
<td>0.5 – 5.0</td>
<td>0.5 – 5.0</td>
</tr>
<tr>
<td>C18:1</td>
<td>53.0 [55.0] – 83.0 [85.0]</td>
<td>53.0 [55.0] – 83.0 [85.0]</td>
<td>53.0 [55.0] – 83.0 [85.0]</td>
</tr>
<tr>
<td>C18:2</td>
<td>2.53.5 – 21.0</td>
<td>2.53.5 – 21.0</td>
<td>2.53.5 – 21.0</td>
</tr>
<tr>
<td>C18:3[^3]</td>
<td>2.53.5 – 21.0</td>
<td>2.53.5 – 21.0</td>
<td>2.53.5 – 21.0</td>
</tr>
<tr>
<td>C20:0</td>
<td>0.0 ≤ 0.6</td>
<td>0.0 ≤ 0.6</td>
<td>0.0 ≤ 0.6</td>
</tr>
<tr>
<td>C20:1</td>
<td>0.0 – 0.4 ≤ 0.5</td>
<td>0.0 – 0.4 ≤ 0.5</td>
<td>0.0 – 0.4 ≤ 0.5</td>
</tr>
<tr>
<td>C22:0</td>
<td>0.0 ≤ 0.2</td>
<td>0.0 ≤ 0.2</td>
<td>0.0 ≤ 0.2</td>
</tr>
<tr>
<td>C24:0</td>
<td>0.0 – 0.2</td>
<td>0.0 – 0.2</td>
<td>0.0 – 0.2</td>
</tr>
</tbody>
</table>

[^2] The country of retail sale may require a more specific designation.
[^3] Pending the results of IOC (International Olive Council) survey and further considerations by the Committee on Fats and Oils. National limits may remain in place.
Trans fatty acids

\[ \Sigma(t\text{-C18:1}) \leq 0.05 \]

\[ \Sigma(t\text{-C18:2}) + \Sigma(t\text{-C18:3}) \leq 0.4 \]

3.2.2 \( \Delta \text{ECN42} \) (Maximum dDifference between the actual and theoretical ECN 42 triglyceride content)

**Extra virgin olive oil**

Virgin olive oils \( \leq 0.2 \)

Refined olive oil \( \leq 0.3 \)

**Virgin olive oil**

Composed of refined olive oil and virgin olive oils \( \leq 0.3 \)

3.2.3 Sterol and triterpene dialcohol composition

4α-Desmethyldersterols composition (% total 4α-desmethyldersterols)

Cholesterol \( \leq 0.5 \)

Brassicasterol \( \leq 0.2 \text{ for olive-pomace oils} \)

Campesterol \( \leq 4.0 \)

Stigmasterol \( < \text{campesterol} \)

Delta \( \Delta^7 \)-stigmastenol \( \leq 0.5 \)

Apparent Beta \( \beta \)-sitosterol: \( \Delta^7 \)-stigmastenol + \( \Delta^5 \)-avenasterol + \( \Delta^5 \)-24-stigmastadienol + clerosterol + sitostanol + \( \Delta^5 \)-24-stigmastadienol \( \geq 93.0 \)

(a) When an authentic oil naturally has a campesterol level >4.0% and ≤ 4.5%, it is considered virgin or extra virgin olive oil if the stigmasterol level is ≤ 1.4% and the delta-7-stigmastenol level is ≤ 3.3%. The other parameters shall meet the limits set out in the standard.

(b) For virgin olive oils if the value is >0.5 y ≤0.8%, campesterol must be ≤3.3, apparent [\( \beta \)-sitosterol/(campesterol+\( \Delta^7 \)-stigmastenol) ≥25, stigmasterol ≤1.4, and \( \Delta \text{ECN42} \) ≤0.1]. For refined olive pomace oils values >0.5 and ≤0.7% then stigmasterol ≤1.4, and \( \Delta \text{ECN42} \) ≤ 0.4.

(c) Chromatographic peak composed by \( \Delta^5 \)-23-stigmastadienol+clerosterol+\( \beta \)-sitosterol+sitostanol+\( \Delta^5 \)-avenasterol+\( \Delta^5 \)-24-stigmastadienol peaks.

[Virgin olive oil’s authenticity is not compromised if one sterol, or their minimum content, does not fall within the ranges provided for if all other sterols and parameters tested referred to in this standard fall within the stated ranges.]

3.2.4 Minimum value for total sterol Total 4α-desmethyldersterols content (mg/kg)

Virgin olive oils \( \geq 1,000 \)

Refined olive oil \( \geq 1,000 \)

Olive oil composed of refined olive oil and virgin olive oils \( \geq 1,000 \)

Refined olive-pomace oil \( \geq 1,800 \)

Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils \( \geq 1,600 \)
3.2.5 Maximum δ-Erythrodiol and uvaol [content] (% total sterols α-desmethylsterols + erythrodiol and uvaol)

<table>
<thead>
<tr>
<th>Product</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 4.5</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td></td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td></td>
</tr>
<tr>
<td>Refined olive oil</td>
<td></td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>&gt; 4.5</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td></td>
</tr>
</tbody>
</table>

3.2.6 Waxes content (mg/kg)

<table>
<thead>
<tr>
<th>Product</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 250</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td></td>
</tr>
<tr>
<td>Refined olive oil</td>
<td></td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 350</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td></td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>&gt; 350</td>
</tr>
</tbody>
</table>

Maximum difference between the actual and theoretical ECN 42 triglyceride content

<table>
<thead>
<tr>
<th>Product</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virgin olive oil</td>
<td>0.2</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>0.3</td>
</tr>
<tr>
<td>Olive oil</td>
<td>0.3</td>
</tr>
<tr>
<td>Olive-pomace oil</td>
<td>0.5</td>
</tr>
</tbody>
</table>

3.2.7 Maximum Stigmastadienes content (mg/kg)

<table>
<thead>
<tr>
<th>Product</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 0.150</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td></td>
</tr>
<tr>
<td>Olive oil</td>
<td></td>
</tr>
<tr>
<td>Olive-pomace oil</td>
<td></td>
</tr>
</tbody>
</table>

3.2.8 Percentage of 2-glyceryl monopalmitate (2P) (% total monoacylglycerol)

<table>
<thead>
<tr>
<th>Product</th>
<th>Condition</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>If C16:0 ≤ 14.0 %; 2P ≤ 0.9 %</td>
<td></td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>If C16:0 &gt; 14.0 %; 2P ≤ 1.0 %</td>
<td></td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>If C16:0 ≤ 14.0 %; 2P ≤ 0.9 %</td>
<td></td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>If C16:0 &gt; 14.0 %; 2P ≤ 1.1 %</td>
<td></td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>2P ≤ 1.4 %</td>
<td></td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>2P ≤ 1.2 %</td>
<td></td>
</tr>
</tbody>
</table>

3.2.9 Delta K [AK(f,g)]

<table>
<thead>
<tr>
<th>Product</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 0.01</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td></td>
</tr>
</tbody>
</table>

(f) Defined as
\[
\Delta K_{270} = \frac{1}{2} (K_{266} + K_{274})
\]

(g): 270 nm when using cyclohexane; 268 nm when using iso-octane.
### 3.3 QUALITY FACTORS

#### 3.3.1 Organoleptic characteristics (odour and taste) of virgin olive oils

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Median of the <em>most perceived</em> defect</th>
<th>Median of the fruity attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>$Me = 0.0$</td>
<td>$Me &gt; 0.0$</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>$0 &lt; Me \leq [2.5]$</td>
<td>$[3]$ $[3.5]$</td>
</tr>
<tr>
<td>Ordinary virgin olive oil</td>
<td>$2.5 &lt; Me \leq 6.0^*$</td>
<td>or when the median of the defect is less than or equal to 2.5 and the median of the fruity attribute is equal to 0.</td>
</tr>
</tbody>
</table>

#### 3.3.2 Free fatty acids (g/100 g, expressed as oleic acid)

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>$\leq 0.8$</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>$\leq 2.0$</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>$\leq 0.3$</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>$\leq 1.0$</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>$\leq 0.3$</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>$\leq 1.0$</td>
</tr>
</tbody>
</table>

#### 3.3.3 Peroxide value (milliequivalents of active oxygen/kg oil)

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>$\leq 20$</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>$\leq 20$</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>$\leq 5$</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>$\leq 15$</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>$\leq 5$</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>$\leq 15$</td>
</tr>
</tbody>
</table>

#### 3.3.4 Absorbency

**Absorbance** in the ultraviolet ultraviolet region ($K_{270}$at 270/or 268 nm$(f)$ (expressed as $K_{270}$or $K_{268}$)

<table>
<thead>
<tr>
<th>Type of Olive Oil</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>$\leq 0.22$</td>
</tr>
<tr>
<td>Virgin olive oil</td>
<td>$\leq 0.25$</td>
</tr>
<tr>
<td>Ordinary virgin olive oil</td>
<td>$\leq 0.30$</td>
</tr>
</tbody>
</table>
Refined olive oil ≤ 1.10
Olive oil composed of refined olive oil and virgin olive oils ≤ 0.90
Refined olive-pomace oil ≤ 2.00
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils ≤ 1.70
(f): 270 nm when using cyclohexane; 268 nm when using iso-octane.
* After passage of the sample through activated alumina, absorbency at 270 nm shall be equal to or less than 0.11.

3.3.5 Delta KΔK(f,g)

Extra Virgin olive oil ≤ 0.01
Virgin olive oil ≤ 0.04
Ordinary virgin olive oil ≤ 0.01
Refined olive oil ≤ 0.16
Olive oil composed of refined olive oil and virgin olive oils ≤ 0.15
Refined olive-pomace oil ≤ 0.20
Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils ≤ 0.18
(f) Defined as

\[ \Delta K_{270} = K_{270} - \frac{1}{2} (K_{266} + K_{274}) \]

\[ \Delta K_{268} = K_{268} - \frac{1}{2} (K_{264} + K_{272}) \]

(g): 270 nm when using cyclohexane; 268 nm when using iso-octane.

[3.3.6 Fatty acid ethyl esters (mg/kg)]

[Extra virgin olive oil] ≤ 35

4. FOOD ADDITIVES

4.1 Virgin olive oils

No additives are permitted in these products.

4.2 Refined olive oil, olive oil composed of refined olive oil and virgin olive oils, refined olive-pomace oil, and olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

The addition of alpha-tocopherols (d-alpha tocopherol (INS 307a); mixed tocopherol concentrate (INS 307b); dl-alpha-tocopherol (INS 307c)) to the above products is permitted to restore natural tocopherol lost in the refining process. The concentration of alpha-tocopherol in the final product shall not exceed 200 mg/kg.

5. CONTAMINANTS

5.1 The products covered by this Standard shall comply with the Maximum Levels of the General Standard for Contaminants and Toxins in Food and Feed (CXS 193-1995).

5.2 Pesticide residues

The products covered by the provisions of this standard shall comply with those maximum residue limits established by the Codex Alimentarius Commission for these commodities.

5.3 Halogenated solvents

Maximum content of each halogenated solvent: 0.1 mg/kg
Maximum content of the sum of all halogenated solvents: 0.2 mg/kg

6. HYGIENE

It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the General Principles of Food Hygiene (CXC 1-1969), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

The products should comply with any microbiological criteria established in accordance with the Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods (CXG 21-1997).
7. LABELLING
The products shall be labelled in accordance with the *General Standard for the Labelling of Prepackaged Foods* (CXS 1–1985).

7.1 Name of the food
The name of the product shall be consistent with the descriptions as shown in Section 3 of this standard. In no case shall the designation ‘olive oil’ be used to refer to olive-pomace oils.

7.2 Labelling of Non-Retail Containers
Information on the above labelling requirements shall be given either on the container or in accompanying documents, except that the name of the food, lot identification and the name and address of the manufacturer or packer shall appear on the container.

However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. METHODS OF ANALYSIS AND SAMPLING
All the methods referenced in this appendix must be applied in its last revision. The most updated version of the methods should be used, in application of ISO/IEC 17025.

<table>
<thead>
<tr>
<th>Provision</th>
<th>Method</th>
<th>Principle</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>Organoleptic characteristics of virgin olive oils</td>
<td>COI/T.20/Doc. n° 15</td>
<td>Panel test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AOCS Cd 3d-63 (03)</td>
<td>Titrimetry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COI/T.20/Doc. n° 34</td>
<td>Titrimetry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AOCS Ca 5a-40</td>
<td>Titrimetry</td>
</tr>
<tr>
<td>8.3</td>
<td>Peroxide value</td>
<td>ISO 3960</td>
<td>Titrimetry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AOCS Cd 8b-90 (03)</td>
<td>Titrimetry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COI/T.20/Doc. n° 35</td>
<td>Titrimetry</td>
</tr>
<tr>
<td>8.4</td>
<td>Absorbanance in the ultraviolet region</td>
<td>COI/T.20/Doc. n° 19</td>
<td>Absorption in ultraviolet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISO 3656</td>
<td>Absorption in ultraviolet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AOCS Ch 5-91 (01)</td>
<td>Absorption in ultraviolet</td>
</tr>
<tr>
<td>8.5</td>
<td>Fatty acid composition</td>
<td>COI/T.20/Doc. n° 24 33 and ISO 5508:1990</td>
<td>Gas chromatography</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AOCS Ch2-91</td>
<td>Gas chromatography</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or AOCS Ce 11-96</td>
<td>Gas chromatography</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISO 12966-2 and ISO 12966-4. Sample preparation ISO5509:20000 or AOCS Ce 2-66 (87)</td>
<td>Gas chromatography</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Method</td>
<td>Reference</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td>8.6</td>
<td>4α-desmethylsterol composition and its total content and erythrodiol and uvaol</td>
<td>Gas chromatography</td>
<td>COI/T.20/Doc. nº 1026, ISO 12228-2:1999, AOCS Ch 6-91 (97)</td>
</tr>
<tr>
<td>8.7</td>
<td>Waxes and ethyl esters content</td>
<td>Gas chromatography</td>
<td>COI/T.20/Doc. nº 128, AOCS Ch 8-02 (02)</td>
</tr>
<tr>
<td>8.8</td>
<td>Stigmastadienes content</td>
<td>Gas Chromatography</td>
<td>COI/T.20/Doc. nº 11, or ISO 15788-1:1999, or ISO 15788-2 or AOCS Cd 26-96</td>
</tr>
<tr>
<td>8.9</td>
<td>The Difference between the actual and theoretical ECN 42 triglyceride</td>
<td>Analysis of triglycerides of HPLC and calculation</td>
<td>COI/T.20/Doc. nº 20, AOCS Ce 5b-89 (02)</td>
</tr>
<tr>
<td>8.10</td>
<td>Percentage of 2-glyceryl monopalmitate</td>
<td>Gas Chromatography</td>
<td>COI/T.20/Doc. n° 23, ISO 12872</td>
</tr>
<tr>
<td>8.11</td>
<td>Determination of ΔK</td>
<td>Absorption in ultraviolet</td>
<td>COI/T.20/Doc. n° 19, ISO 3656, AOCS Ch 5-91</td>
</tr>
<tr>
<td>8.12</td>
<td>Alpha-tocopherol content</td>
<td>HPLC</td>
<td>ISO 9936:1997, AOCS Ce 8-89</td>
</tr>
<tr>
<td></td>
<td>Determination of the content of fatty acid ethyl esters -FAEE</td>
<td></td>
<td>COI/T.20/Doc. N° 28</td>
</tr>
<tr>
<td></td>
<td>Determination of trans fatty acid content</td>
<td></td>
<td>COI/T.20/Doc.n°17 or ISO 15304-2002 or AOCS Ce 11-96(02)</td>
</tr>
<tr>
<td></td>
<td>Determination of erythrodiol content</td>
<td></td>
<td>COI/T.20/doc..No 30-2011.</td>
</tr>
<tr>
<td>Commodity Category</td>
<td>Method of sampling</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>Olive oils and Olive-Pomace Oils</td>
<td>ISO 661 and ISO 5555</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OTHER QUALITY AND COMPOSITION FACTORS

These quality and composition factors are supplementary information to the essential composition and quality factors of the standard. A product which meets the essential quality and composition factors but does not meet these supplementary factors, may still conform to the standard.

2. QUALITY CHARACTERISTICS

1.1 Organoleptic characteristics

Extra virgin and virgin olive oils: See Section 3.1

Others:

<table>
<thead>
<tr>
<th>Type of oil</th>
<th>Perceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined olive oil</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>Good</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>Acceptable, Good</td>
</tr>
</tbody>
</table>

Appearance at 20°C for 24 hour

Refined olive oil, olive oil, refined olive-pomace oil, olive-pomace oil: Limpid

1.2 Moisture and volatile matter (g/100 g)

<table>
<thead>
<tr>
<th>Virgin olive oils</th>
<th>Maximum level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra virgin olive oil</td>
<td>≤ 0.2 %</td>
</tr>
<tr>
<td>Virgin olive oils</td>
<td>≤ 0.1 %</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>≤ 0.1 %</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 0.1 %</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>≤ 0.1 %</td>
</tr>
<tr>
<td>Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils</td>
<td>≤ 0.1 %</td>
</tr>
</tbody>
</table>

1.3 Insoluble impurities in light petroleum (g/100 g)

<table>
<thead>
<tr>
<th>Extra virgin olive oil</th>
<th>Maximum level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virgin olive oils</td>
<td>≤ 0.1 %</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>≤ 0.1 %</td>
</tr>
<tr>
<td>Olive oil composed of refined olive oil and virgin olive oils</td>
<td>≤ 0.05 %</td>
</tr>
</tbody>
</table>
1.4 Absorbency  
Absorbance in the ultraviolet region at 232 nm (expressed as $K_{232}$)

- Extra virgin olive oil: ≤ 2.50
- Virgin olive oil: ≤ 2.60

[1.5 1,2-diglycerides (% total diglycerides)]

- Extra virgin olive oil: > 35

[1.6 Pyropheophytin "a" (% total chlorophyll pigments)]

- Extra virgin olive oil: ≤ 17

1.7 Trace metals (mg/kg)

- All olive oils and olive-pomace oils
  - Iron (Fe): ≤ 3.0 mg/kg
  - Copper (Cu): ≤ 0.1 mg/kg

2. COMPOSITION CHARACTERISTICS

<table>
<thead>
<tr>
<th>Saturated fatty acids at the 2-position in the triglyceride (sum of palmitic &amp; stearic acids):</th>
<th>Maximum level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virgin olive oils</td>
<td>1.5%</td>
</tr>
<tr>
<td>Refined olive oil</td>
<td>1.8%</td>
</tr>
<tr>
<td>Olive oil</td>
<td>1.8%</td>
</tr>
<tr>
<td>Refined olive-pomace oil</td>
<td>2.2%</td>
</tr>
<tr>
<td>Olive-pomace oil</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

3. CHEMICAL AND PHYSICAL CHARACTERISTICS

2.1 Relative density ($d_{20}$) (20 °C/water at 20 °C)

| Extra virgin olive oil | 0.910-0.916 |
| Virgin olive oil | 0.910-0.916 |
| Refined olive oil | 0.910-0.916 |
| Olive oil composed of refined olive oil and virgin olive oils | 0.910-0.916 |
| Refined olive-pomace oil | 0.910-0.916 |
| Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils | 0.910-0.916 |

2.2 Refractive index ($n_{D}^{20}$)

| Extra virgin olive oil | 1.4677-1.4705 |
| Virgin olive oils | 1.4677-1.4705 |
| Refined olive oil | 1.4677-1.4705 |
| Olive oil composed of refined olive oil and virgin olive oils | 1.4677-1.4705 |
| Refined olive-pomace oil | 1.4680-1.4707 |
| Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils | 1.4680-1.4707 |

The country of retail sale may require compliance with these limits when the oil is made available to the end consumer.
2.3 Saponification value (mg KOH/g)

- **Extra virgin olive oil**
- Virgin olive oils
- Refined olive oil
- Olive oil composed of refined olive oil and virgin olive oils
- Refined olive-pomace oil
- Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

Values:
- 184-196

- **Virgin olive oil**
- Refined olive oil
- Olive oil composed of refined olive oil and virgin olive oils

Values:
- 182-193

- **Refined olive oil**
- Olive oil composed of refined olive oil and virgin olive oils

Values:
- 182-193

- **Olive oil**
- Refined olive-pomace oil
- Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

Values:
- 182-193

2.4 Iodine value (Wij's method)

- **Extra virgin olive oil**
- Virgin olive oils
- Refined olive oil
- Olive oil composed of refined olive oil and virgin olive oils

Values:
- 75-94

- **Refined olive-pomace oil**
- Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

Values:
- 75-92

2.5 Unsaponifiable matter (g/kg)

- **Extra virgin olive oil**
- Virgin olive oils
- Refined olive oil
- Olive oil composed of refined olive oil and virgin olive oils

Values:
- ≤ 15 g/kg

- **Refined olive-pomace oil**
- Olive-pomace oil composed of refined olive-pomace oil and virgin olive oils

Values:
- ≤ 30 g/kg

[2.6 Total 4α-desmethylsterols content (mg/kg)]

[Extra virgin olive oil]

[Virgin olive oil] [> 1,000]

43. METHODS OF ANALYSIS AND SAMPLING

The most updated version of the methods should be used, in application of ISO/IEC 17025.

<table>
<thead>
<tr>
<th>Provision</th>
<th>Method</th>
<th>Principle</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Moisture and volatile matter</td>
<td>ISO 662:1998</td>
<td>Gravimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOCS Ca 2c-25</td>
<td>Gravimetry</td>
<td></td>
</tr>
<tr>
<td>3.2 Insoluble impurities in light petroleum</td>
<td>ISO 663:2000</td>
<td>Gravimetry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>or AOCS Ca 3a-46</td>
<td>Gravimetry</td>
<td></td>
</tr>
<tr>
<td>3.3 Trace metals (iron, copper)</td>
<td>ISO 21033</td>
<td>ICP-OES</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>AOAC 990.05</td>
<td>AAS</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>AOCS Ca 18b-91</td>
<td>AAS</td>
<td>II</td>
</tr>
<tr>
<td>3.4 Relative density</td>
<td>IUPAC 2.161 with</td>
<td>Pycnometry</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>appropriate conversion factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ISO 6883</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AOCS Cc 10c-95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>Refractive index</td>
<td>ISO 6320:2000</td>
<td>Refractometry</td>
</tr>
<tr>
<td></td>
<td>ISO 3657:2002</td>
<td>AOCS Cc 7-25 (92)</td>
<td>Refractometry</td>
</tr>
<tr>
<td>3.6</td>
<td>Saponification value</td>
<td>ISO 3961:1996</td>
<td>Titrimetry</td>
</tr>
<tr>
<td></td>
<td>AOCS Cd 3-25 (93)</td>
<td>AOAC 993.20</td>
<td>Wijs-Titrimetry</td>
</tr>
<tr>
<td>3.7</td>
<td>Iodine value</td>
<td>ISO 3961:1996</td>
<td>Wijs-Titrimetry</td>
</tr>
<tr>
<td>3.8</td>
<td>Unsaponifiable matter</td>
<td>ISO 3596:2000</td>
<td>Gravimetry</td>
</tr>
<tr>
<td></td>
<td>ISO 18609:2000</td>
<td>AOCS Ca 6b-53 (01)</td>
<td>Gravimetry</td>
</tr>
<tr>
<td>3.9</td>
<td>Absorbance in the ultraviolet region – K232</td>
<td>COI/T.20/Doc. nº 19</td>
<td>Absorption in ultraviolet</td>
</tr>
<tr>
<td></td>
<td>ISO 3656:2002</td>
<td>AOCS Ch 5-91 (01)</td>
<td>Absorption in ultraviolet</td>
</tr>
<tr>
<td>3.10</td>
<td>[pyropheophytin “a”]</td>
<td>[ISO 29841]</td>
<td>[HPLC]</td>
</tr>
<tr>
<td>3.11</td>
<td>[1,2-diglycerides]</td>
<td>[ISO 29822]</td>
<td>[Gas chromatography]</td>
</tr>
<tr>
<td>3.12</td>
<td>[4α-desmethylsterol total content]</td>
<td>[COI/T.20/Doc. nº 26]</td>
<td>[Gas chromatography]</td>
</tr>
<tr>
<td></td>
<td>[ISO 12228-2]</td>
<td>[AOCS Ch 6-91]</td>
<td>[Gas chromatography]</td>
</tr>
<tr>
<td></td>
<td>[AOCS Ch 3-91 (97)]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fatty acids in the 2-position of the triglycerides</td>
<td>ISO 6800:1997</td>
<td>[AOCS Ch 3-91 (97)]</td>
</tr>
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<td></td>
<td>Organoleptic characteristics</td>
<td>COI/T.20/Doc. nº 15</td>
<td>Pane-Test</td>
</tr>
</tbody>
</table>

**Commodity Category** | **Method of sampling** | **Notes**
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